

Claims

- [c1] 1. A gear set for a vehicle having a drive shaft and a rear axle, comprising:
a pinion gear connected to the drive shaft, the pinion gear having a plurality of teeth;
a ring gear connected to the rear axle and having a plurality of teeth that are engaged by the teeth of the pinion gear;
the teeth of the ring gear and the teeth of the pinion gear are super-finished to a low surface roughness; and
wherein the super-finished teeth of the pinion gear drive the super-finished teeth of the ring gear with a higher axle efficiency.
- [c2] 2. The gear set of a vehicle of claim 1 wherein the super-finished surface provides a mirror finish.
- [c3] 3. The gear set for a vehicle of claim 1 wherein the super-finished surfaces improve the fuel efficiency of the vehicle.
- [c4] 4. The gear set for a vehicle of claim 1 wherein the super-finished ring gear and pinion gear are not provided with a break-in coating before being used in the vehicle.

[c5] 5. A gear set for a vehicle having a drive shaft and a rear axle, comprising:
a pinion gear connected to the drive shaft, the pinion gear having a plurality of teeth;
a ring gear connected to the rear axle and having a plurality of teeth that are complementary to the teeth of the pinion gear;
the teeth of the ring gear and the teeth of the pinion gear having a super-finished surface, wherein the super-finished surface is provided by placing the ring gear and pinion gear in a vessel containing an acid solution and ceramic pebbles, wherein the acid solution creates a film on the ring gear and pinion gear, and the ceramic pebbles remove the film, providing a surface finish having an average roughness of 4–7 microinches; and
wherein the super-finished teeth of the ring gear are driven by the super-finished teeth of the pinion gear and
wherein increased power transmission efficiency is realized due to a reduction of the coefficient of friction between the ring gear and the pinion gear.

[c6] 6. A gear set for a vehicle having a drive shaft and a rear axle, the gear set having a pinion gear connected to the drive shaft, the pinion gear having a plurality of teeth, and a ring gear connected to the rear axle, the ring gear having a plurality of teeth that mesh with the teeth of the

pinion gear, and the teeth of the ring gear and the teeth of pinion gear have a super-finish provided by the method of:

placing the pinion gear and the ring gear in a first vessel containing an acidic solution and ceramic pebbles;

etching of the surface of the pinion gear and the ring gear by the acidic solution, the acidic solution further leaving a film on the ring gear and the pinion gear;

using the ceramic pebbles to remove the film from the pinion gear and the ring gear;

placing the ring gear and the pinion gear in a second vessel containing a solution which neutralizes the acidic solution in the first vessel; and

wherein the super-finished teeth of the ring gear are driven by the super-finished teeth of the pinion gear and wherein a reduced coefficient of friction between the ring gear and the pinion gear leads to improved rear axle efficiency.